

13.10 INCLUDING THE TIME DIMENSION IN RADAR-RAINGAUGE BLENDING

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The aim of the geostatistical methods to combine rainfall measurements by meteorological radars and rain gauge networks for improved rainfall estimation is to benefit from the direct rainfall observations at ground from rain gauges, and the detailed description of the space-time variability of the rainfall field captured by radar measurements (with typical resolutions of 1 km and 5-10 minutes).

Velasco-Forero et al. (2009) proposed to use Kriging with external drift (KED) with non-parametric variograms. The method uses the radar rainfall estimates as the drift to interpolate raingauge observations, and considers the anisotropy of the rainfall field thanks to the use of two-dimensional variograms, which are updated every time new (radar and gauges) rainfall observations are available. The work presented here explores the extension of that technique to include the time dimension in the blending process, so that rainfall estimates are based, not only on current observations, but also on past observations. This extension accounts for the correlation in time, and implicitly imposes some coherence between consecutive QPE maps.

The technique has been evaluated for several rainfall events in the area of Barcelona (NE Spain), analysing the effect on the results of factors such as the rain gauge density or the accumulation window.